Botanical Notes, 1917-1918.

FRANK U. G. AGRELIUS.

As late as October 22, 1917, we observed the following plants in bloom at what is an unusual date:

Diervilla florida Sieb. & Zucc. (*Weigela rosea* of the garden).

Viola pedata Linn.

Spiræa trilobata Linn. (*Spiræa Van Houttei* of the catalogues).

The ordinary dandelion, *Taraxacum officinale* Weber, did not bloom and produce seed during every winter month this season, as it did the winter of 1916-'17. We observed certain facts in connection with this bothersome pest during the summers of 1916 and 1917, in the Rocky Mountains. Here in Kansas it is more or less vexatious. In Colorado it is a serious mischiefmaker in some places, especially in the higher meadows of the alpine region. Where the farmers have previously been able to secure a considerable amount of hay or pasturage, there is practically nothing but dandelions. It is the "English sparrow" of the plant kingdom. And its end is not yet.

POLYCOTYLEDONY OF ANGIOSPERMS.

For some time we have been interested in noting the presence of three cotyledons in certain young plants or seedlings. We found this to be true occasionally in the tomato, especially in some varieties. We marked these plants, intending to observe them later, and to determine whether this characteristic would show any sign of being hereditary. Through oversight and accident we lost these specimens. We have observed none in some tomato seedlings this spring. A former student last year observed this phenomenon in some bean seedlings. Notwithstanding several untoward events, he succeeded in growing one pod to maturity and has promised me the seeds for testing this year. We hope to have some further data on this later.

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The Common Rocks and Gem Stones of Kansas, and How to Recognize Them.

M. M. SCHMIDT.

This paper is not written for the professional mineralogist, but for the everyday student and layman who has not the time nor the means to delve deep into the technical study of the large variety and classes of rocks and gem stones that come to his sight, and yet would like to have some rule or guide whereby he could name and recognize the abundance God has planted in the earth's crust or exposed to his view. There is no one, however disinterested he may be, who has not at some time wondered what some fine colored specimen was that chanced to come to his sight. Rocks fascinate most of us. I can remember quite distinctly when a small boy, I strolled through our pasture and picked up the many beautiful specimens of colored stones and wondered what their

names were, their composition, their common characteristics and how they were placed there. I made up my mind that if I was ever able to name and distinguish them, I would do my best to make it easier for others who might be troubled like I was. Hence the reason for this paper.

It may sound strange to some of us, but Kansas has nearly all the important rocks in some form or condition. Outside of a very few rare gems or crystals, I have found in Marshall county the major classes of all rocks and also most of their subclasses.

I want to make clear in the beginning the classification of five common kinds of rock. Of course there are many, many more than this, but this will suffice us now for this first lesson. We should learn to distinguish and classify the following: Quartz, calcite, feldspar, mica and hornblende. If we learn these five great classes thoroughly, we will be in a fine way to become competent petrologists and able to identify most of the common rocks found in our state. I will take these up singly and discuss their common characteristics, their composition and their various subclasses.

Quartz is one of the most common and abundant. It is quite easily recognized by its very hard, glassy, lustrous appearance. Pure, clear quartz is easily recognized, but the young petrologist is at times confused by its many subdivisions, with its many colors, variegations and forms in which it is found. Quartz is very hard, will scratch glass and cannot be cut or indented with a knife blade. It has no regular cleavage, always breaking irregularly. It is the essential constituent of many other rocks, as granite, gneiss and the sandstones. It is in many instances the cement which binds together the other elements into one mass or stone. In chemical composition it is a union of oxygen and silicon, nearly the same elements of our Portland cement. We recognize fifteen different varieties or subclasses:

Black Quartz, a smoky or black variety.

Yellow Quartz, a clear variety, but yellow or citron colored.

White Quartz, or Milk Quartz, a white, milky colored variety.

Rhinestone, a clear, brilliant variety, also called *Water* diamond, *Cape May* diamond, or *Lake George* diamond.

Amethyst, a beautiful clear purple variety.

Carnelian, a red, waxy variety.

Opal, a white variety, opalescent, with a beautiful play of colors.

Chalcedony, almost like carnelian, but a duller color, not so clear.

Chrysoparse, a chalcedony, but of apple green color.

Heliotrope, a dark green variety, not transparent, flecked with red spots and commonly called bloodstone.

Jasper, an opaque variety, often banded, and in blue or green colors.

Flint, a dull, impure variety of dark gray or black color.

Chert, also a dull flint or purer variety, but very brittle.

Cat's Eye, the substance of silicified trees, which when highly polished, gives a play of colors like a cat's eye, hence the name.

Agate, we recognize three varieties—Onyx, that variety which is always variegated, that is, having distinct bands or lines. Onyx is always banded with white and either black or brown lines. If it was colored otherwise, it would not be called Onyx. *Sardonyx*, just like onyx, only that the bands are of white and red or white and pink or these three colors together. Do not confuse Jasper with the banded agates, although it is just like the agates in everything except that the Jasper has bands of blue or green and the wise men who have named the gems have not seen fit to call Jasper an agate. Then we have also *Moss Agate*. This is a clear stone; it may be almost either of the above classes, but is flecked with spots of moss or other particles which give it distinct colorings.

These fifteen subclasses then are all quartz, and he who would master a common knowledge of stones should bear in mind that no matter which of them he should have at hand, it is essentially quartz and only quartz. He should bear in mind that these are all of various shapes and forms, colors and variegations, but they have all the common characteristics and composition of the great mother class, Quartz, which is recognized reasonably easy.

Calcite is the second most abundant rock-forming material. It is found all over the world and is one of the most common elements of the rocks of our state. It is the major material of our limestones and chalks, the substance of shells and the marbles. It is a gray or nearly white floury material, which is sometimes very soft and can easily be cut with a knife. It occurs sometimes in crystalline form ranging in various colors through blue, green, black or yellow. Calcite is sometimes incorrectly called spar, but there is quite a difference, as we shall presently see, when we examine that substance. In chemical composition it is a carbonate of lime. Under the action of any acid it has the property of effervescing, liberating carbonic acid gas. Its crystals, while very beautiful, are of no use in the arts, as they are too soft and will not retain a polish.

Feldspar is, perhaps, the third most common and important rock-forming material. It occurs most commonly as a cement in the making of other rocks. It has a pearly luster, not glassy like quartz. It is also less hard, but much harder than calcite. It can be scratched with a sharp knife. It weathers more easily than quartz and in weathering it crumbles in grains, is a granulated substance and not a floury or dusty substance like calcite. It is the pearly substance of the granites and gneisses, and with quartz is the cement that cements the materials of the large red boulders found in the northern counties of Kansas, miscalled "niger heads." It occurs in various colors and gives its color to the rock it constitutes. In chemical composition it is a silicate of alumina. Some of its valuable crystals, though not found in Kansas, are the moonstone, a beautiful opalescent gem when properly polished, and the Amazon stone, a beautiful blue-green crystal found near Pikes Peak, Colorado.

Mica is an important rock-forming material and is probably recognized at sight by most of us on account of its utility in glazing stove doors, automobile curtains, etc. It has a perfect cleavage and will scale

off in thin sheets. It is also associated with other rock-forming materials, and in this way makes schist or a mica pudding stone.

Hornblende, called amphibole by some mineralogists, is not so common in Kansas, and is, as far as I am able to find, found only as an accessory of other rocks. It can be identified by its hardness, its shiny black luster, and its flaky appearance. It has some of the characteristics of mica and is sometimes mistaken for it, but a close examination will show that it is much harder than this substance. Mica can be crumbled with the thumb, but not so with hornblende. In chemical composition it is a silicate of magnesia and is about the same in composition as asbestos, to which it is closely related. Hornblende, like asbestos, is a heat resisting material and fire will have no effect on it.

These, then, quartz, calcite, feldspar, mica, and hornblende, are the great mother classes of rocks most common in our state. There are still others, and some of large importance, found here, but these will suffice for this, our first lesson. If we would give a small amount of time and study to these suggestions and compare specimens of each, it would not be long until we would be able to name and distinguish most of our common rocks. This is a knowledge which any one should be glad and proud to possess. We take great interest in many of the studies of the natural world less interesting than this. And what can be more fascinating than an intimate knowledge of the beauty and utility of those massive structures of rocks hidden deep in the bowels of the earth, or here and there exposed to our view, or now and then crystallized and variegated with a beautiful play of colors, as it were, to make us admire them? This is a science that will give pleasure and profit to its student, will take him to the hills and canyons out in the open world, away from the conventions of man and alone with nature.

Home City, March, 1918.

Sternberg's Expedition to the Red Deer River, Alberta, 1917.

CHARLES H. STERNBERG.

In all my experience as a collector, this has been the most successful expedition of my life in the fossil fields of North America. It has also been one of the most strenuous ones. I received sufficient income the year before from my labors for the British Museum to enable me to employ five men part of the time in the fossil field, and to purchase a team and outfit, so I was independent in regard to transportation. Then the season was ideal for the fossil hunter. We had a severe drouth, little rain falling in the fossil beds. This fact also relieved us from the awful pest of a rainy season, the mosquitoes. I might also say, that another strong incentive to labor was the presence in the Sand creek beds of a competitor, even though he chanced to be my own son, Charles M., who was conducting a party for the Geological Survey of Canada. All these causes, and above all others the energy of my assistants, who gave their unremitted labor from sunrise to sunset, not even taking the time to go fishing during the hours we could work in the field—these causes,